

Title: Using iPads to increase the level of student engagement in enhancing the peer review and feedback process.

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Abstract

This investigation explored the use of iPads in a higher education setting in order to evaluate how and if they could enhance an already established approach to peer review and feedback. The context centred on a cohort of 140 pre-service teacher education students engaged in small group assessed activities in one of their modules. Although some aspects of the existing formative assessment process worked well, the level of student engagement in peer review was felt to need improvement. An opportunity to explore the use of iPads in group work and collaborative learning environments arose as part of the York St John University (YSJ) iPad Project. The management and deployment of the iPads was based on Apple's 'institutional' model (Apple Inc., 2013a) and was informed by the YSJ Technology Enhanced Learning quality framework.

A practitioner research methodology involved collaboration between the tutors, students and technology enhanced learning adviser. Qualitative analysis of student and tutor verbal and written feedback and reflections, questionnaires and observations provided an insight into the level of enhancement attained.

Following the 8 month investigation, a number of findings emerged that highlighted that the use of iPads significantly increased the level of student engagement. Both tutors and students became critical reflectors of the technology as well as formative assessment practice. The institutional management and deployment model played a significant part in the adoption of the technology for the tutors and in the level of student engagement. However, the model also contributed to a level of disruption that enabled the tutors and students to critically evaluate the effectiveness of the iPads in terms of time, workload and enhancement of the peer assessment and feedback process.

1. Introduction, background and aims of the project

1.1 Introduction

The project is set in the context of an undergraduate teacher education programme where two tutors carried out an investigation into whether the use of iPads would enhance the peer-review and feedback components of small-group assessed activities. The cohort (n=140) was organised into five teaching groups based on whether they are training to teach very young children (age 3-7 years) or older primary-age children (5-11 years). As part of their formal assessment within the teaching and learning in science module the students work together in groups of six, on average, to participate in three assessed group activities across the eight month period of the module. A well-established and well-received aspect of the group assessments is peer-review and feedback coupled with tutor-mediated self-assessment by each of the small groups.

The tutors had established that dialogue as part of the assessment process improved engagement and critical evaluation but felt that the element of *peer* engagement in the review and feedback process could be strengthened. Vu and Dall'Alba highlighted the need for research that 'strikes a balance between enhancing the benefits of peer assessment for student learning, while reducing the tension experienced by students' (2007, p.552); this project aimed to do that.

When 20 iPads became available as part of the University's focus on mobile technologies as part of the Technology Enhanced Learning Quality Framework (York St John University, 2012), the tutors took the opportunity to investigate how and if mobile technology might play a part in enhancing the quality and level of engagement in peer review and feedback.

1.2 Background to the York St John University (YSJU) iPad project

The aim of the YSJU iPad Project is to provide opportunities for staff to increase student engagement in the university classroom through the use of mobile/tablet technology. The focus of the project is on exploring the benefits of using iPads in group work and collaborative learning activities and the impact they have on teaching, learning and assessment.

The teacher education proposal for the use of iPads satisfied the aims of the University's iPad Project well and both tutors were encouraged and supported by the iPad Project team in identifying suitable applications that might be appropriate for peer assessment and feedback. The iPad Project Teaching Enhanced Learning (TEL) Adviser played a significant role in the research process.

2. Methodology and data collection

The research method adopted in this investigation was based on action-research. The problem under investigation had been identified by both tutors and students and the solutions or improvements were likely to benefit both. In this respect, the method was more participatory in nature and the exploratory approach might more accurately define the methodology as *practitioner* research (Fuller and Petch, 1995).

In line with the work of Kemmis and McTaggart (1992) opportunities for review and reflection were frequent, built into the on-going assessment process and initially based on separate small-group collaborations. Evidence was collected and evaluated throughout the process and, in so doing, the scope of the investigation increased. Eventually, the full investigation involved tutors, the full cohort of students and the TEL adviser.

2.1 Description and use of applications

2.1.1 eClicker Presenter

The application is made up of two parts: the Presenter and the Audience.

Teachers and presenters use the eClicker Presenter app to enter questions and begin the polling. Participants use the free eClicker Audience app, or their device's web browser, to view and answer the questions, right on their smartphone, tablet or laptop.

(Big Nerd Ranch, 2013 a, b)

The tutors designed statements that the student audience could use to feedback their opinions on the quality of the small group presentations. Nine statements relating to the assessment criteria for the group presentations were loaded into the eClicker Presenter application. Each statement was graded with four response options: strongly agree, agree, disagree and strongly disagree.

At the end of the presentations the students were able to access the statements through eClicker Audience either on the iPads or through their mobile phones via a wifi connection within the teaching space. The eClicker Presenter application enabled the iPad to act as a hub for the 'audience' iPads in the room. As the results were fed back to the presenter iPad they appeared as bar charts providing an overall picture of the audience responses for each statement. The bar charts on the presenter iPad were then used as prompts in the post-presentation discussion between the tutor and the presentation group.

2.1.2 Socrative

Following feedback from the students about the suitability of eClicker (Findings – section 3.2), an alternative application was found which they felt to be more appropriate for their needs.

Unlike eClicker, Socrative is a web-based application, and has the facility for students to add comments to their statement response choices. In other aspects Socrative operated in a similar way to eClicker via teacher and student log in:

Teachers login through their device and select an activity which controls the flow of questions and games. Students simply login with their device and interact real time with the content.

Student responses are visually represented for multiple choice, true/false and Short Answer questions. For pre-planned activities a teacher can view reports online as a google spreadsheet or as an emailed Excel file.

(Socrative, 2013a, b)

The most significant difference that favoured eClicker was the instant analysis of the results into bar charts. This was overcome in Socrative by opening the feedback in a spreadsheet and the comments were easily viewed within there.

2.1.3 Notability (Ginger Labs, 2012)

This application is primarily designed as a note taking application for use with iPads. This application was used by the students to provide feedback on the quality of the classroom displays that their peers had created. The students captured images of a display and then handwrote or typed text directly onto the image. It is possible to 'zoom-in' on specific areas of the display and take additional images. The annotated images were saved

anonymously as pdf documents and uploaded to a cloud-based storage facility; in this case a Dropbox (2013) account from within the Notability application. The pdfs were stored in group folders within Dropbox and a link was emailed to the students who had created the display; they were then able to download and view all of the feedback ready for discussion with the tutor.

3. Findings

3.1 Extent of use

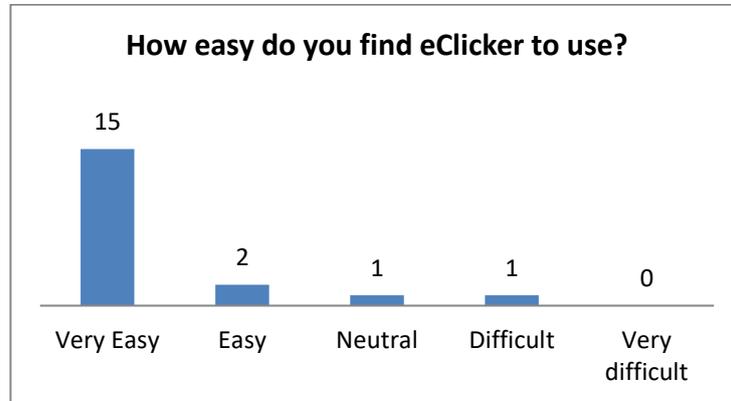
Notability, eClicker and Socrative were used in the module over an eight month period. Each student had the opportunity to use Notability to provide feedback five times, to use eClicker five times and Socrative three times. Feedback via Notability generated approximately 450 pdf files over the period of the investigation. eClicker provided an opportunity for approximately 35 feedback sessions and a further 15 feedback sessions took place using Socrative.

3.2 Feedback

Following informal responses from the students about their use of eClicker and Notability they were invited to complete an online questionnaire about their experiences. They were asked to comment on the ease of use of each of the applications and what they liked in particular and what features they would like to see to improve that experience. There were twenty-two respondents to the questionnaire and, in general, these mirrored the informal comments that the tutors had received during the sessions.

3.2 eClicker

3.2.1 Student responses for eClicker (n=19)



Detailed responses to the question 'What do you like most about giving feedback using eClicker?' were analysed into the following categories:

- Simplicity and ease of use;
- Anonymous;
- Quick;
- Multiple choice/set statements.

Additional responses included:

'It's fun to use iPads!'

'Very clear display'.

'On many occasions eclicker would not load the questions or would only allow you to complete one or 2 questions before logging you out.

When eclicker did work, it was easy to use'.

Responses to the question, 'what features would you like to see that eClicker does not have and why?' revealed an almost unanimous feeling that there should be the option to include comments with the feedback judgements. The reasoning behind this was that the students felt they needed more detail about what they had done well or what the suggestions for improvement might be.

3.2.2 Tutor and TEL adviser observations during eClicker feedback sessions

Positive outcomes

- Students quickly adapted to the use of eClicker;
- All students participated in the peer feedback and some students downloaded eClicker Audience to their mobile phones in order to provide their feedback;
- Students responded well to the feedback statements and felt that this helped them to focus on the assessment criteria;
- Students appreciated the anonymity of the peer feedback;
- eClicker feedback took less time than the previous written comments;
- The students felt that the instant analysis and presentation of the overall judgements was clearly presented and understandable.

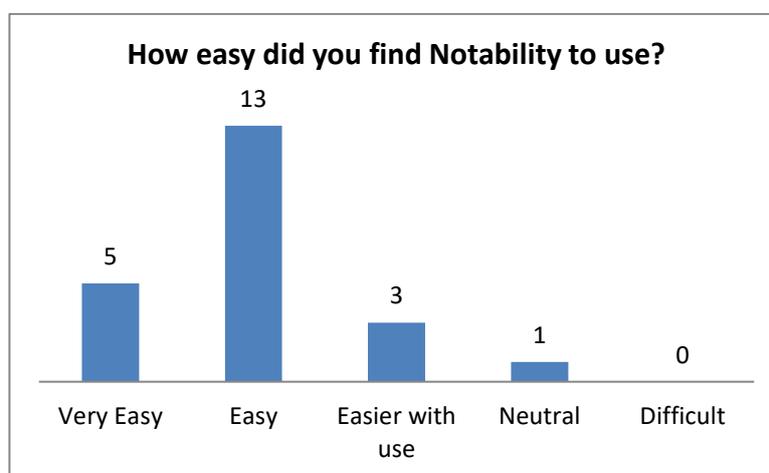
Considerations

- Students receiving the peer feedback felt that they needed more detail about why certain feedback had been given and wanted to know the justification, particularly for the more negative responses.

3.3 Notability

3.3.1 Student responses for Notability (n=22)

Following informal responses from the students about their use of Notability they were all invited to complete an online questionnaire about their experiences. They were asked to comment on the ease of use of each of the applications and what they liked in particular and what features they would like to see to improve that experience.



Detailed responses to the question, 'what do you like most about giving feedback using Notability?' were analysed into the following categories:

- Ease of use;
- Able to focus on exact areas of the display and give targeted feedback;
- Flexibility in terms of how much or how little to write;
- Time to think and consider feedback.

Other responses included:

'It feels very modern and hi-tech to give feedback this way.'

'The software is versatile and the system seems to be quick and effective.'

There were few suggestions for additional features in response to the question, 'what features would you like to see that Notability does not have and why?' but one student felt that the upload procedure to Dropbox could be more straightforward.

3.3.2 Tutor and TEL adviser observations during Notability feedback sessions

Observation and discussion notes revealed:

Positive outcomes

- *All* students in all teaching groups were keen to provide feedback on the displays;
- The speed and confidence in the use of Notability increased with use, in general;
- There was an increased level of peer/peer and peer/tutor discussion about the qualities of the displays as the students constructed their feedback;
- The quality of the annotations improved over time to become more detailed and focussed which was indicative of a deeper level of thinking;
- The students began reflecting on the process of peer feedback as a means of assessment;
- The groups of students were very positive about the amount of feedback received – this could be between 12 and 20 separate pdf files;
- The groups of students always accessed their peer feedback in advance of the tutor discussion meetings and came ready to discuss it.

Considerations

- The time taken to provide feedback in this way impacted on the time available for other activities in the session;
- Although some students became proficient very quickly others were much slower to gain confidence and still required reassurance and guidance in using Notability.

3.4. Management of the iPads and applications

The iPad project adopted the 'Institutional Ownership model' (Apple Inc., 2013). Prior to each teaching session the iPads were prepared by the TEL Adviser with the relevant settings and applications. This involved ensuring that the devices were connected to the institutions wifi network, that the relevant and most update version of the applications were installed, that access to certain features of the device was restricted.

To ensure anonymity during the learning activities each iPad was assigned a generic name. The name was placed on the lock screen of each device and was used by the students when they saved their feedback on the classroom displays to Dropbox. Previously, students had used their initials when saving the files to Dropbox. These were later deleted by the tutor before the feedback was shared with the relevant group.

The management of the iPads continually evolved throughout the eight month period they were used with students. Initially, students were asked to sign-into Dropbox and select the correct folder to save their feedback. After the early sessions it was clear that this was likely to lead to confusion due to the number of students and the need to access specific folders. The most significant change to the process was, therefore, the setup of the Dropbox account prior to the session before the classroom display activity.

Regular updates to both the iOS (the iPad operating system) and the applications were required throughout the duration of the project. Occasionally, the reduced quality of the wifi connection in the teaching room meant that the Notability pdf files needed to be uploaded to Dropbox after the session rather than during it. Connectivity between eClicker Presenter and eClicker Audience was also affected by the quality of the connection meaning that on occasion reconnection was necessary and previous feedback data from that session was lost. After each session the iPads were collected by the TEL Adviser and

synchronised with the Apple Configurator (Apple Inc., 2012). This removed all content that had been created on the device.

Positive outcomes

- Setting up the folder structure in Dropbox prior to the teaching session gave for more streamlined and straightforward upload procedure. This prevented students from saving feedback files in the wrong location.
- The ability to disable the app store and in app purchases and other iOS features prevent students from being distracted whilst engaging with the learning activity. Apple's Volume Purchasing Program (Apple Inc., 2013b) allowed us to purchase apps (in quantities of 20+) at a discounted rate. Currently, app developers have the option to make there app available at a reduced rate (up to 50% off) for educational institutions.

Considerations

- The preparation and management of the iPads became resource intensive. Prior to each session the TEL adviser had to sign-in to Dropbox on each device (20 in total) and set up the connection with Notability.
- Occasionally, the reduced quality of the wifi connection in the teaching room meant that the Notability pdf files needed to be uploaded to Dropbox after the session rather than during it. Connectivity between eClicker Presenter and eClicker Audience was also affected by the quality of the connection meaning that on occasion reconnection was necessary and previous feedback data was lost.
- Although there are clear advantages to an institutional model for managing the iPads this does limit access to them and, as such, limits spontaneity and creativity in their use; all sessions needed to be pre-planned and booked on the system.

Discussion

What we all hoped was that the iPads and the applications we used were appropriate, met everyone's needs and enhanced the previous methods. The desire for success was, however, not necessarily driven by the same goals for tutors and students; the tutors' goal was a deeper level of critical engagement from the students whilst the students, in the initial stages, were more concerned with the novelty of being able to use the iPads on a regular basis. The tutors felt that the opportunity to use iPads within sessions led to a greater level of motivation on the part of the students to participate in the feedback process.

With increased familiarity and confidence in the use of iPads came an increase in the quality of the peer feedback. With regard to Notability, the level of detail in the feedback improved and comments became more developmental and forward-focussed. We cannot underestimate the importance of regular use of technology in order to embed it fully within pedagogical process. Making access to feedback flexible for the students was well-received and supported the findings of Conole, de Laat, Dillon & Darby in their study that looked at the role of technology in changing study patterns in higher education contexts (2008). Flavin discusses the lack of engagement with new technologies or superficial use within classrooms (2012). His work goes on to identify a reluctance to exploit the true potential of technology with a focus on the disruptiveness of the technologies as they interrupt established routine. Deegan and Rothwell (2010) identified a range of potential barriers with regard to either the perceived or actual issues associated with the fitness for purpose of technology hardware and applications. Interestingly, though, work by Liu, Li and Carlsson (2010) suggested that ease of use (or lack of it) was not an indicator of likelihood

of adoption of m-learning methods and technology. In our study, some students did feel the iPads were a distraction at times and felt they were time consuming and not part of the learning process. These students were in the minority but nevertheless, this may have implications for their future practice in the classroom and this is worthy of further study.

Furthermore, the presence of technical support within the classroom, certainly in the initial stages, was advantageous to the effective and productive use of the technology for the students and tutors alike. What we should not assume is that all students are 'digital natives' (Prensky, 2001) and we should be mindful that according to Bennett this does not apply across a whole population but to certain subgroups and we should address equally the potential for a 'digital divide' (2012, p.4).

Conclusion

In terms of the outcomes of the study, the students did engage more with peer review and feedback when the iPads were used and the approach did enhance established practice. However, this increased level of engagement revealed issues in terms of the students' level of understanding about formative assessment which can now be addressed within the module. A direct consequence of the iPads has, therefore, been a raised awareness of students' attitude towards peer assessment which will then inform module design and assessment procedures. The next steps are to further explore the technology and applications in order to help engage students more in setting their own assessment criteria.

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